clinical skill can match CAD accuracy rates stressing the importance of continuing clinical teaching and supervision of junior doctors. CAD does provide an ongoing database which would help medical audit as has been rightly stressed. However, the general advocacy of use of CAD for diagnostic purposes in the busy A&E department would not only be time consuming, leading to increased patient waiting time, an important factor determining patient satisfaction, (Maitra & Chickhani, 1992) but would also not be cost effective (not improving patient care because the diagnostic accuracy rate is low).

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Foley catheter haemostasis for penetrating cardiac wounds: the need for caution

Sir

We were interested to read the article on intracardiac fluid therapy following emergency thoracotomy (Moulton *et al.*, 1992) in your June issue. We would like to comment on the use of Foley catheter (balloon) haemostasis for penetrating cardiac injuries.

Recently we used this technique of balloon haemostasis and fluid administration in a young male patient who was brought in with a stab wound to his left anterior chest wall. He presented with signs of hypovolaemia and cardiac tamponade. He underwent an emergency thoracotomy which revealed a haemopericardium and an anterior left ventricular penetrating wound. Following pericardial decompression, a Foley catheter was introduced through the ventricular wound and the balloon inflated to 10 ml. This only achieved partial haemostasis as the bleeding continued from the wound margin. Traction on the balloon led to an increase in the wound size. Inflation of the balloon to 20 ml caused a significant drop in his already reduced systolic blood pressure. We were able to administer a large volume of crystalloid solution and blood through the Foley catheter very rapidly and this helped his perfusion. Our patient however continued to bleed and died.

At post-mortem, a further wound on the posterior wall of left ventricle was identified.

Foley catheter haemostasis, although first used for peroperative cardiac tears, has now been reported and advocated for penetrating cardiac wounds in the emergency situation (Wilson *et al.*, 1986). The animal model by Moulton *et al.* (1992) underscores the advantages of intracatheter fluid administration which we appreciated in our clinical situation. Beyond this, we would sound a note of caution.

Firstly, balloon haemostasis may not be as effective as it is made out to be. The wound often bleeds around the balloon. Live and contracting cardiac muscle, in contrast to animal models, is prone to tearing on traction with the balloon. In a large study of penetrating cardiac wounds, the authors had resorted to digital occlusion rather than balloon haemostasis followed by suturing (Attar *et al.*, 1991).

Secondly, inflation of the Foley balloon compromises the cardiac output by reducing ventricular filling. Increasing the balloon size has been shown to cause a significant fall in cardiac index, stroke volume index and mean arterial pressure in pig heart models (Pham *et al.*, 1989). Such a depression of cardiac function has been our experience too and has led us away from the use of Foley catheters in penetrating cardiac wounds.

Lastly, the presence of a penetrating wound on one ventricular wall does not preclude another. While attempts are being made to achieve haemostasis at the obvious site of penetration, the patient may well exsanguinate through another which is not so obvious.

Our patient had a through and through penetrating wound to his left ventricle.

In conclusion, we would like to caution strongly any future use of this catheter haemostasis technique. In our opinion and experience, whilst being theoretically attractive, this is overrated and in practice fraught with danger. Digital occlusion and pledgeted suture remain the time-honoured method.

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